New Census Bureau Data Product: Monthly State Retail Sales

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Delivering on data users' request

- More timely state-level retail sales are the among the most requested data by our data users.

- In September 2020, the Census Bureau released the new Monthly State Retail Sales (MSRS) data product.

- First version of these experimental data.

- Invite users to provide feedback on how to improve this experimental product.

What data are available?

Year-over-year percentage changes by month back to January 2019 for:

- Total Retail Sales excluding Nonstore Retailers

- 11 Retail Subsectors

  - Motor vehicle and parts dealers (NAICS 441)

  - Furniture and Home Furnishing (NAICS 442)

  - Electronics and Appliances (NAICS 443)

  - Building Materials and Supplies Dealers (NAICS 444)

  - Food and Beverage (NAICS 445)

  - Health and Personal Care (NAICS 446)

  - Gasoline Stations (NAICS 447)

  - Clothing and Clothing Accessories (NAICS 448)

  - Sporting Goods and Hobby (NAICS 451)

  - General Merchandise (NAICS 452)

  - Miscellaneous Store Retailers (NAICS 453)

- The state-level data is not adjusted for seasonal variation, trading-day differences, moving holidays or price changes.

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How are the data modeled?

Estimates are created using a composite model that is a weighted average of synthetic estimates and survey data and third-party data based hybrid estimates. The weight used in estimation is based on the ratio of the variance of the synthetic estimator to the total variance of both estimators.

Synthetic State Estimates

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For each state and 3-digit NAICS combination, national Monthly Retail Trade Survey (MRTS) brick & mortar sales are allocated to states using administrative data (payroll) totals for each NAICS.

Estimate for each State & NAICS

$$= \text{National MRTS Sales for NAICS} * \frac{\text{Payroll for State \& NAICS}}{\text{National Payroll in NAICS}}$$

Modeled State Estimates

=

MRTS brick & mortar sales → For MRTS retailers with more than one store location but all store locations are in the same state.
For MRTS retailers with only one store location

+

Sum of third-party data brick & mortar sales → For MRTS retailers with more than one store location whose store-location or state-level data is available through a third-party

+

Imputed brick & mortar sales → For MRTS retailers with more than one location who operate in multiple states and are not included in third-party data sales and information from third-party data

+

Adjustment → To account for retailers with only one location that are not in MRTS or in the third-party data

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Limitations of the data

Synthetic Estimator

- Based primarily on total annual payroll and national MRTS estimates, any regional or state seasonal patterns are not reflected in the estimates.
- Does not directly use available establishment level data like the hybrid estimator does.

Hybrid Estimator

- Single store location retailers that are not in MRTS are not directly imputed but are accounted for using a national industry level adjustment ratio.

State sales estimates in each three-digit NAICS are calculated independently each month. Year-over-year percentage changes may exhibit more variation if the coverage or percentage of composite estimator coming from the hybrid model changes between years.

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What are the data quality metrics?

These data are experimental and may not meet all of the quality standards of our official statistical products.

To allow data users to assess the quality of the data, we are providing a variety of quality metrics including:

- **Standard errors** provide measures of variability for the year-to-year percentage changes and can be used to construct confidence intervals when drawing inferences about the data.

- A **Coverage** metric is produced for all monthly estimates, at the individual industry by state-level and at aggregated levels to show the proportion of the estimates that is directly collected either through MRTS or through a third-party data source. This metric also considers the proportion of the composite estimate coming from the hybrid estimate and will be lower the more the composite estimator has to rely on synthetic estimate, which does not use directly reported data. The quality of the model improves with better coverage.

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How good is MSRS coverage?

NAICS	NAICS Description	Average monthly non-imputed MSRS coverage is…
441	Motor Vehicle and Parts Dealers	Greater than or equal to 10% and less than 25% of the NAICS total
442	Furniture and Home Furnishings Stores	Less than 10% of the NAICS total.
443	Electronics and Appliance Stores	Less than 10% of the NAICS total.
444	Building Material and Garden Equipment and Supplies Dealers	Less than 10% of the NAICS total.
445	Food and Beverage Stores	Less than 10% of the NAICS total.
446	Health and Personal Care Stores	Less than 10% of the NAICS total.
447	Gasoline Stations	Less than 10% of the NAICS total.
448	Clothing and Clothing Accessories Stores	Less than 10% of the NAICS total.
451	Sporting Goods, Hobby, Musical Instrument, and Book Stores	Greater than or equal to 10% and less than 25% of the NAICS total
452	General Merchandise Stores	Greater than or equal to 50% of the NAICS total
453	Miscellaneous Store Retailers	Greater than or equal to 10% and less than 25% of the NAICS total
ALL	Total Retail Sales Excluding Nonstore Retailers	Greater than or equal to 10% and less than 25% of the NAICS total

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How are the data validated?

Compared to available external data sources:

Third-party data sources

Publicly available state-provided data

- Typically available from state revenue department
- Small number of states have the data available by month and NAICS

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MSRS Sales Comparison at Total

Comparison of state-provided data against MSRS year-over-year percentage changes for Total Retail Sales excluding Nonstore Retailers.
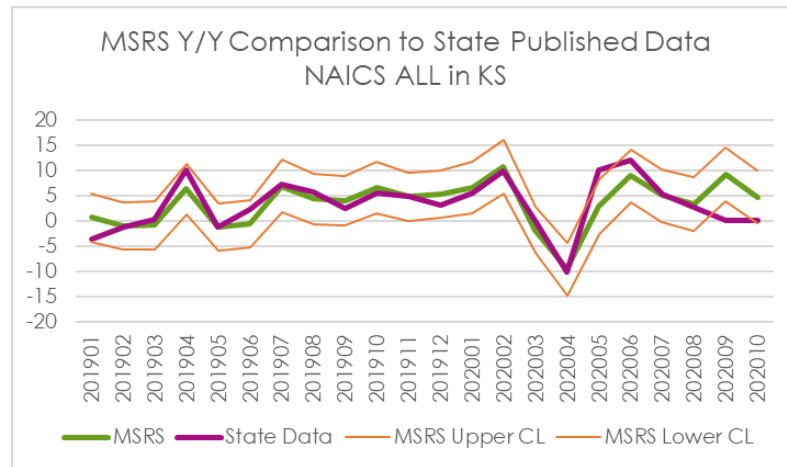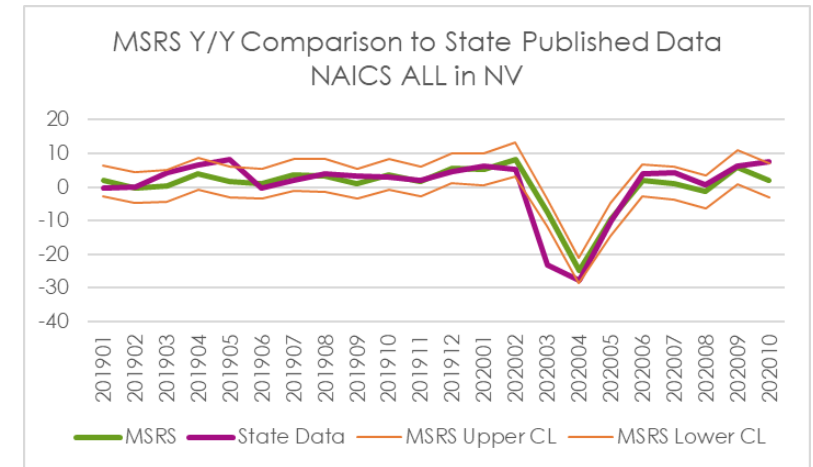

Average monthly non-imputed MSRS coverage for Kansas at the Total Retail Sales excluding Nonstore Retailers is greater than or equal to 10% and less than 25% of the NAICS/State total.
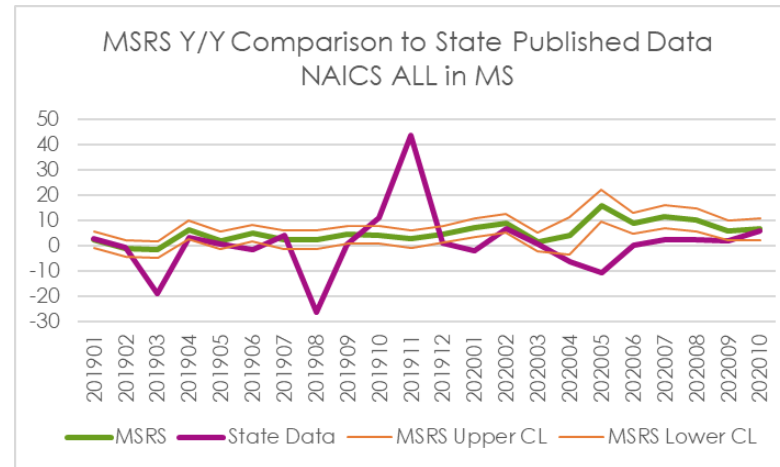
Average monthly non-imputed MSRS coverage for Mississippi at the Total Retail Sales excluding Nonstore Retailers is greater than or equal to 10% and less than 25% of the NAICS/State total.
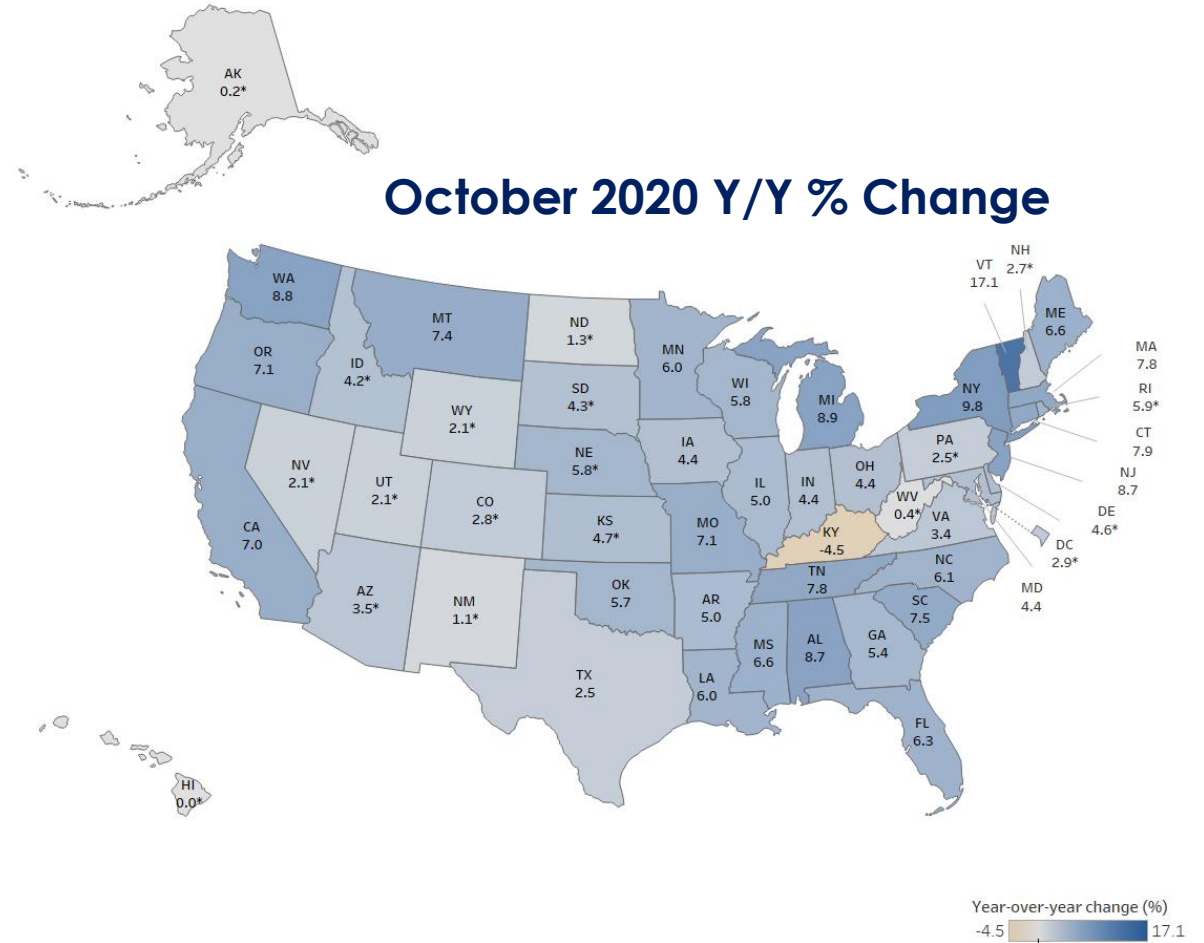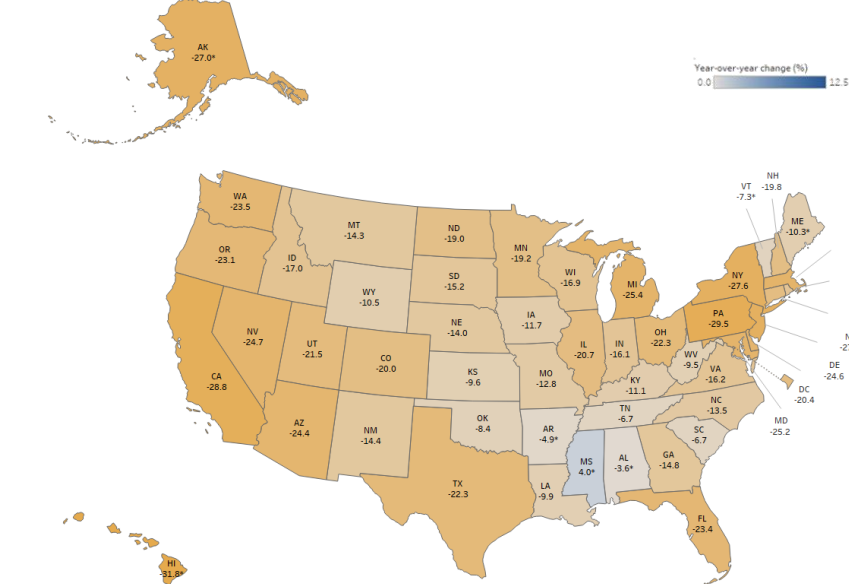
Average monthly non-imputed MSRS coverage for Nevada at the Total Retail Sales excluding Nonstore Retailers is greater than or equal to 10% and less than 25% of the NAICS/State total.

Source: October 2020 MSRS Report, Kansas and Mississippi Departments of Revenue, Nevada Department of Taxation

Total Retail Sales Excluding Nonstore Retailers by State

January 2020 Y/Y % Change

April 2020 Y/Y % Change

October 2020 Y/Y % Change

Source: October 2020 MSRS Report
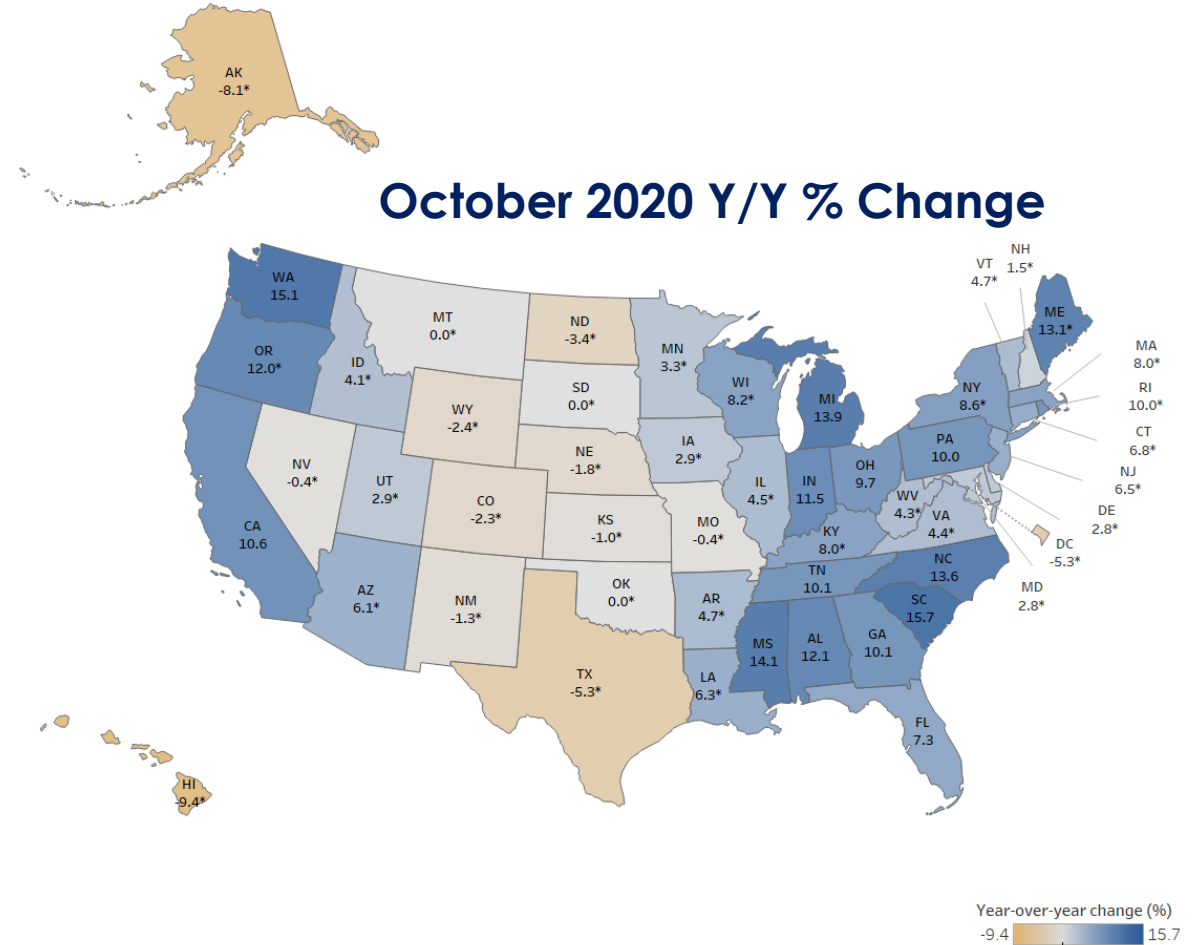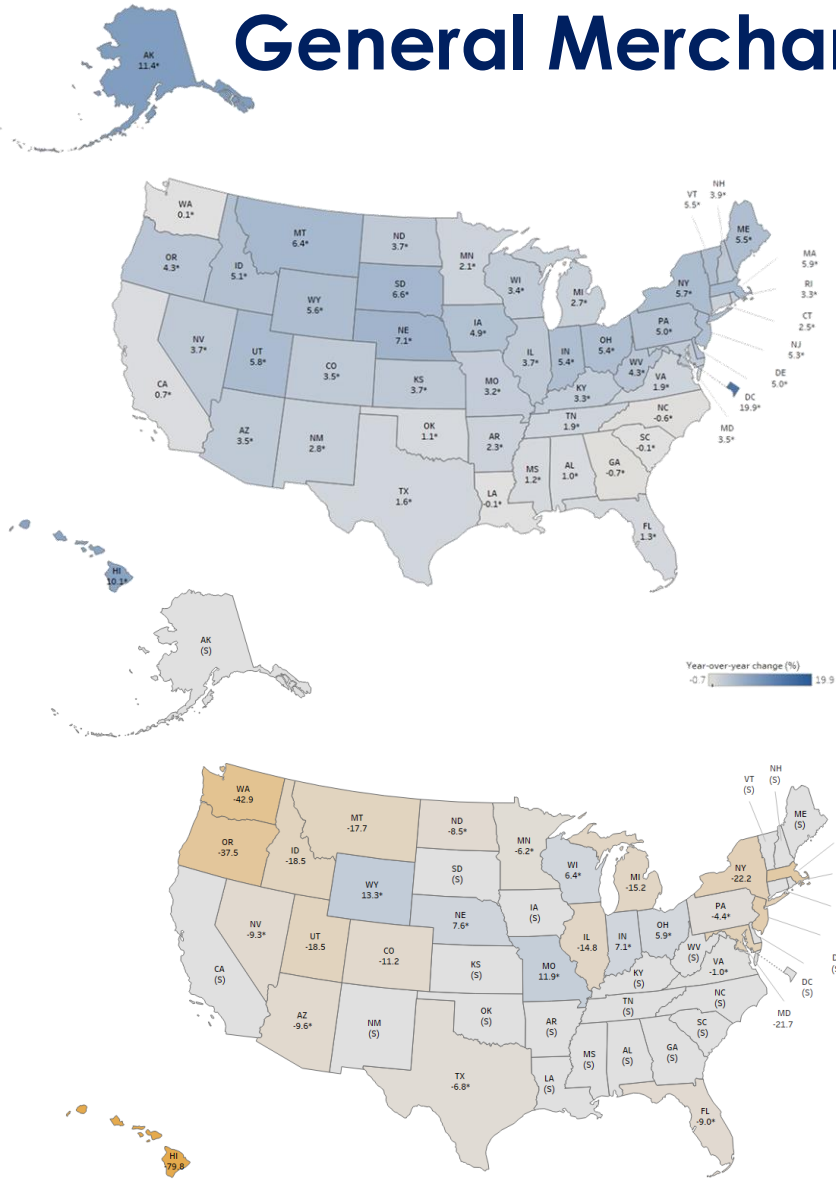
S = Estimate suppressed due to quality concerns

* The 90 percent confidence interval includes zero. There is insufficient statistical evidence to conclude that the actual change is different from zero.

Note: State retail sales data not adjusted for seasonal variation, trading-day differences, moving holidays or price changes.

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General Merchandise (NAICS 452) Retail Sales by State

January 2020 Y/Y % Change

April 2020 Y/Y % Change

October 2020 Y/Y % Change

Source: October 2020 MSRS Report
S = Estimate suppressed due to quality concerns
* The 90 percent confidence interval includes zero. There is insufficient statistical evidence to conclude that the actual change is different from zero.
Note: State retail sales data not adjusted for seasonal variation, trading-day differences, moving holidays or price changes.

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Gasoline Stations (NAICS 447) Retail Sales by State

January 2020 Y/Y % Change

April 2020 Y/Y % Change

October 2020 Y/Y % Change

Source: October 2020 MSRS Report
S = Estimate suppressed due to quality concerns
* The 90 percent confidence interval includes zero. There is insufficient statistical evidence to conclude that the actual change is different from zero.
Note: State retail sales data not adjusted for seasonal variation, trading-day differences, moving holidays or price changes.
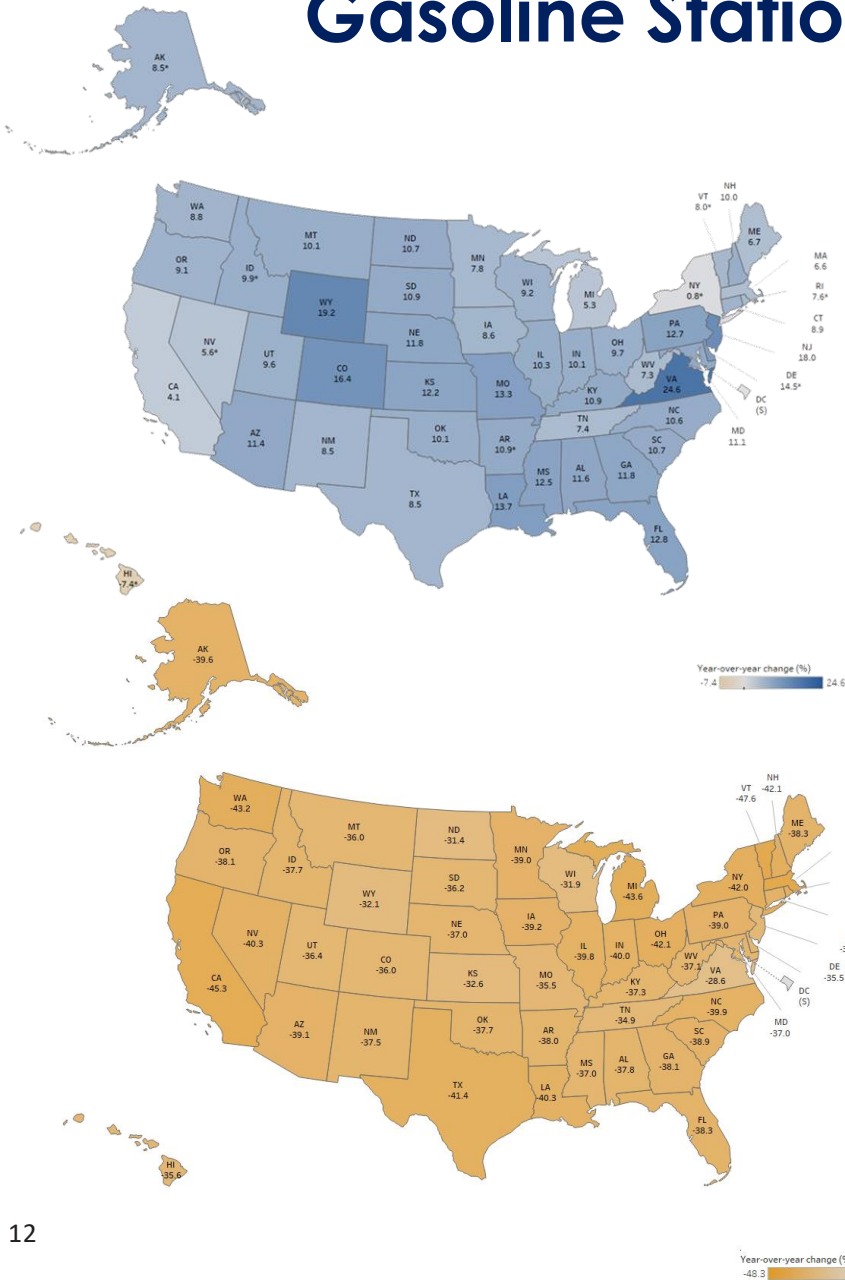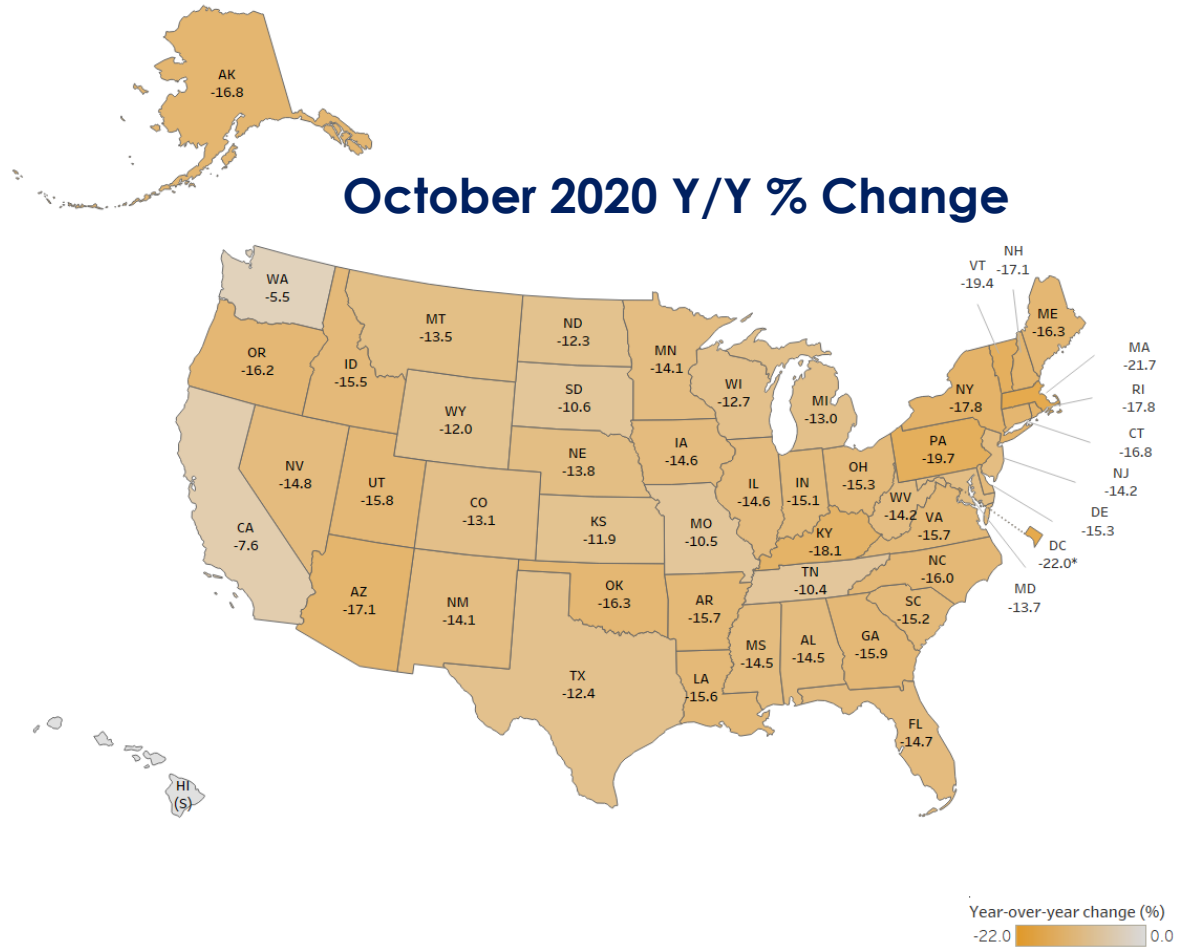
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Feedback from MSRS data users

- *"This data is extremely helpful for a general sense of the State's strengths. I would appreciate seeing this on a county-by-county basis as well. Hoping this will be part of the functionality in the future."*

- *"Are there plans to add NAICS 722 Food services & drinking places to the state-level estimates? Happy to see the development of this new state-level data product."*

- *"I wanted to let you know I really like the monthly retail sales visualization. I can definitely see data users being interested in this product, especially since it features state level data on a map with comparisons over time and geography (state vs national)."*

- *"I love this idea, and I hope it sticks."*

- *"I wanted to email and thank you for releasing the MSRS data. I am a tenured faculty member at … and am already planning on incorporating these data into multiple executive education programs, my capstone undergraduate course, and will be highlighting the data tomorrow to my industry connections on LinkedIn. One of my doctoral students and I are already planning on using these data to understand the effects that the COVID-19 pandemic has had on state-level changes in retail sales (for some reason, I doubt we will be the only ones to do this)."*

- *"Just writing to say thank you for collecting and publishing the new Monthly State Retail Sales data series. At our small economics firm, we have been waiting for something like this for a long time."*

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What's next?

- Determine method to allocate e-commerce sales to states and publish Nonstore Retailer sales by state.

- Publish retail sales levels in addition to year-over-year percentage changes.

- Incorporate more store-location or state-level data that is directly collected either from a survey or third-party data to improve the quality of the data.

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Questions?

- Are there are data sources that you know of that could be used in the MSRS composite model?

- What improvements could we make to the model to make the data more useful to those in your specific expertise/industry/practice?

- Are there groups or organizations that would benefit from this state-level retail data that we should reach out to?

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